



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,702	02/23/2004	Robert Maher	P04461-D11 (11461.00.0189)	1291
23418 7590 02/20/2008 VEDDER PRICE KAUFMAN & KAMMHOLZ 222 N. LASALLE STREET CHICAGO, IL 60601			EXAMINER DU, THUAN N	
			ART UNIT 2116	PAPER NUMBER
			MAIL DATE 02/20/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/784,702

Applicant(s)

MAHER ET AL.

Examiner

Thuan N. Du

Art Unit

2116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25,27,37 and 39 is/are allowed.
- 6) ☒ Claim(s) 23,24,26,28-36,38 and 40-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment (dated 10/31/07).
2. Claims 23-46 are presented for examination.
3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 23 and 35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 7,062,666 in view of Jones et al.

Art Unit: 2116

[Jones] (U.S. Patent No. 4,750,112) and further in view of Ward et al. [Ward], U.S. Patent No. 4,821,176

Claim 1 of the patent contains all limitations of claims 23 and 35 of the instant application except an operation suspension instruction received by the first pipeline subcircuit portion and in response thereto, asserting one or more control signals from said first pipeline subcircuit portion; and disable said first clock signal and thereby suspending said executing of said one or more data processing instructions.

Jones discloses a method for suspending operation of a pipelined data processor to reduce power consumption which comprising the step of receiving an operation suspension instruction (I21 causes the suspension of the IP, therefore I21 is interpreted as operation suspension instruction) with the first pipeline subcircuit portion [col. 9, lines 25-28] and in response thereto, asserting one or more control signals from said first pipeline subcircuit portion [col. 9, lines 27-30].

Ward discloses that an execution of data processing instructions is suspended upon disabling a clock signal [col. 11, line 67 to col. 12, line 3].

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the operation suspension instruction received by the first pipeline subcircuit portion taught by Jones as an occurrence which triggers an interruption to suspend the operation of the pipeline data processor, and to use the disabling of clock signal to suspend the execution of data processing instructions as taught by Ward to reduce the power consumption of the system.

Claim Rejections - 35 USC § 103

6. Claims 23-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. [Jones], U.S. Patent No. 4,750,112 in view of Ward et al. [Ward], U.S. Patent No. 4,821,176.

7. Regarding claims 23 and 35, Jones teaches a method for suspending operation of a pipelined data processor to reduce power consumption, comprising:

receiving an enabled first clock signal [col. 6, lines 39-61];

receiving one or more data processing instructions with a first portion of a pipeline subcircuit (Instruction Pipeline, IP) [Figs. 2, 5; col. 8, lines 53-58];

executing said one or more data processing instructions with a second portion (Execution Pipeline, EP) of said pipeline subcircuit subsequent to said first pipeline subcircuit portion [Figs. 2, 5]; and

receiving an operation suspension instruction (I21 causes the suspension of the IP, therefore I21 is interpreted as operation suspension instruction) with said first pipeline subcircuit portion [col. 9, lines 25-28] and in response thereto

asserting one or more control signals from said pipeline subcircuit [col. 9, lines 27-30], and

disabling said first clock signal [Fig. 5 shows that the clock signal of the suspended IP during T24 is disabled (no clock pulse)].

Jones does not explicitly disclose that the execution of the data processing instructions is in response to an enabled of a clock and that a disable of the clock results in suspension of the execution of the data processing instructions.

Ward teaches that an execution of data processing instructions (micro-instructions) is in response to an enabled of a clock (disable clock line is INACTIVE) and that a disable of the clock (disable clock line is ACTIVE) results in suspension of the execution of the data processing instructions [col. 11, line 67 to col. 12, line 3].

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Jones and Ward because it would reduce the power consumption of the system.

8. Regarding claims 24 and 36, Jones teaches that receiving an operation suspension instruction comprises receiving a halt instruction (I21 causes the suspension of the IP, therefore I21 is interpreted as a halt instruction) [col. 9, lines 25-28].

9. Regarding claims 26, 28, 38 and 40 Jones teaches that prior to said asserting one or more control signal, completing executing one or more of said one or more data processing instructions which had been received prior to said receiving said operation suspension instruction [Fig. 5, I19 has been completed in the pipeline prior to the suspension].

10. Regarding claims 29 and 41, Jones teaches that detecting an occurrence of a combination of respective states of one or more interrupt signals and in response thereto re-enabling said first clock signal [the clock signal of the IP is re-enable, at T25, upon the completion of I21 (modify a register)].

11. Regarding claims 30 and 42, Jones teaches that one or more further data processing instructions are advanced into the first pipeline subcircuit portion and executed with the second pipeline subcircuit portion in response to said re-enabled clock signal [Fig. 5; I22 is advanced into stage AG and executed in EP at T25].

Art Unit: 2116

12. Regarding claims 31-33 and 43-45, Jones teaches the system including registers for indicating the states of the pipeline subcircuit portions [col. 6, lines 50-54]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the existing register for indicating whether the pipeline subcircuit portion is in a suspended state [the indication of a suspension state, inherently, indicates the disabling of the corresponding clock signal].

13. Regarding claims 34 and 46, Jones teaches that generating a second clock signal having an enabled state substantially independently of said first clock [col. 5, lines 40-59].

Allowable Subject Matter

14. Claims 25, 27, 37 and 39 are allowed.

Response to Arguments

15. Applicant's arguments with respect to claims 23, 24, 26, 28-36, 38, and 40-46 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan N. Du whose telephone number is (571) 272-3673. The examiner can normally be reached on Monday-Friday: 7:30 am - 4:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Perveen Rehana can be reached on (571) 272-3676.

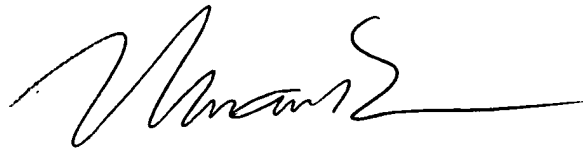
Art Unit: 2116

Central TC telephone number is (571) 272-2100.

The fax number for the organization is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

TD
February 8, 2008



THUAN N. DU
PRIMARY EXAMINER